

portion at the surface of the rotating Sun, and designate the mean velocity of retarded oscillation by  $v_1$ ; the velocity of infinite fall by  $v_2$ ; under any assumed expansion or contraction of the Sun's mass,

$v_1 \propto \frac{1}{r}$ ,\* while  $v_2 \propto \sqrt{\frac{1}{r}}$ . If we wish to find the limiting velocity  $v^0$  for the value of  $r$ , ( $r^0 = r \div x^2$ ), which renders  $v_1^0 = v_2^0$ , we have the equation

$$v^0 = v_1^0 = v_2^0 = v_1 x^2 = v_2 x$$

$$\therefore x = v_2 \div v_1$$

Taking Norton's estimate of solar radius (425,061.5) the value of  $v_2$  is 375.5 miles per second, and various estimates of the time of solar rotation give the following values of  $v_1$  and  $v_0$ .

	$v_1$	$v_0$
Spörer.....	.799	176,440
Carrington.....	.788	178,920
Lelambre.....	.787	179,210
Faye.....	.785	179,660
Petersen.....	.781	180,470
De La Rue, Stewart and Loewy.....	.781	180,560
Herschel, (Bianchi and Langier).....	.777	181,460
Harmonic prediction ( $\frac{7}{25} \oplus$ ).....	.771	182,800

The velocity of light, as deduced from Norton's value of solar radius, is 183,450 miles per second, which is approximately identical with the limiting velocity,  $v_0$ .

TRANSCRIPT OF A CURIOUS MANUSCRIPT WORK IN CYPHER,  
SUPPOSED TO BE ASTROLOGICAL.

BY PLINY EARLE CHASE.

(Read before the American Philosophical Society, October 3d, 1873.)

The work, of which I have prepared the accompanying transcript, was bought in Amsterdam, about seventy years ago. It consists of forty-four manuscript pages, on twenty-four triangular leaves of parchment, measuring nine inches on a side, substantially bound in a hog-skin cover. It has been kept in a plush-lined tin case, so that it is in a state of excellent preservation, and appears as if newly written. On the lid of the case is a figure of a dragon, together with the following inscription, greatly defaced, but still distinct enough to be perfectly legible.

“EX DONO SAPIENTISSIMI COMITIS ST GERMAIN QUI ORBEM TERRARUM PERCURRIT.”

The cypher consists of twenty-six arbitrary characters. In preparing to transcribe it, I counted the number of times each character was used, substituting  $a$  for the one that occurred most frequently,  $b$  for the next in frequency, and so on. The words are often run together, but there are numerous breaks, which I have indicated, some of which appear to mark divisions between words, while others may be arbitrary, or intended as blinds.

\* In consequence of the law of equal areas.



10	11	12
hf	dlasjahdoadehbhrn afeafe ldbge	bn
jao	a qha jahde affangef wmhceafe	mac
geaqha	afedadeig qbg oge sdarfac	bobfeea
ehbhd bc	kbfe eihe jac egaljac k	cimadbe
boal eig da	ac egaljac eifjaogead	gife
mifkdb bnaf	amifkdb bnaf	jamaegeidpge
ehpafgdbe afchge	eh oadcadbelae	aliflafedgqha
akajaflafc sqhbeda	aflafc pafge	ace ja jg ahihehea
jbnmac ka jb nbfgadac	hd jatahs	eg afkdbc mafkbfeec
hg obfea ikgahaeadfaj ae	ehbjjh	imad egife jbhed aidpg
dacihoadbfg pafge lae aflafc	adbe	eaqhg ace bh kae eihe ace
slac jbnmacbtgf qhajahdti	eac	jb mjbla qillhmadbeifjaogea
	j	

13	14	15
ehcadbeoaehlinnabh xvihd	eifjaogeeachgodb af mid	d
ekac ladanifgackac eblgd	ebfe jb damdacafebeg	afk
tglae af afedbfekbfceif	if kae ldbblea	hbjbm
idpgeaeh bhdbce afenb	d ac kad aoaj	jbla qhg
gfrbhlua jbtgrhdacea	beg if	e ace kaceg
(in astrological diagram)	jideqha	fa ehd anaead
brjb brjb caedrnbuceif	ehca	bc beif jaogea
	db	btgrhda boal jb qha
	e	

16	17	18
jjaeh aeige afed a bji	cb	cieugi pafge-ja
dc eif jaogea bgbfe	ldaac	eidgzge pafge-ja
aeailhmad jbc	fiein	bmubj pafge-ja
gaffaehpafgdb	bdrdeae	brani pafge-ja
ceifidpgea	pafgelaeidp	euipbeeb
af mditadb	gea pafge-ja	pafge-ja
fe laem	wbfikb pafge-ja	bdgy
bdij	ngija pafge-ja	pafg
ac	bjbr pafge-ja	cja

19  
 p  
 bzi  
 db eig  
 qhg oges  
 darfac kbfee  
 ihe jacegaljac  
 kaecgaljac eifj  
 aogeadamifkdb bnaf  
 afehgeaehgfoi qhadbeja

20  
 cjac aemdgec bqhgyvbg  
 kiffa ja mihoigdkam  
 daegkad bhuxkajbfh  
 ge aflinnaflbf  
 ekh lieaihea  
 jaoajacij  
 agj saf  
 kgeb  
 e

21  
 j  
 abnbf  
 jalgbp  
 phebfbogi  
 dgpd bj  
 eajbdi  
 khlieaihe alihl  
 ua ja cijagj

22  
 ajbfb  
 jambp  
 heebaj  
 euaddhp  
 eiebdali  
 jgjpmbml  
 kh liea  
 jamj  
 hc

23  
 a  
 jaha  
 kajidgea  
 jagb  
 ajgfb  
 bngrbpgdaj  
 kh liea ja mjhepbe  
 kajidpgea  
 makghpbz

24  
 tgjalubn  
 lu bdegaj  
 ehtadbe aflidkhllea  
 ihe ajaoajacijag  
 j jgfoi lbegif  
 ehgobfea mdi  
 ceadfaoad  
 ejbead  
 da

25  
 fih  
 coihe  
 gfoiqhi  
 f wbjbenb  
 sjangdie  
 jalgbpseajbd  
 uadgpbrs bdfiogi  
 edbpb s bgie  
 bfgaj sjakgnbe

26  
 vbfbajs lbjybe  
 jabei s ogbfiaj  
 sfihe oiheidkiff  
 ife mbd lajhgmdb  
 qhg eiheacl  
 uic acife  
 aeatbge  
 esmbd  
 eih  
 e

27  
 jac  
 bheac  
 fincka  
 j acafajs  
 mbd lajhgka  
 wbfikb  
 aj  
 nguijac  
 uijba yapieu

28

fijgl cbz  
 s fiebnnbdrbeae  
 qhg acejac agrfa  
 hdkg ah ajaoa ka  
 oihcdamdaca  
 fead md ack  
 alaeidp  
 geag  
 fog  
 c

29

gp  
 jan af  
 e skana  
 tbgdaliff  
 igeda mbd hfa  
 vhcea gfemgdbeg  
 if egoihen afvhr  
 akgrfa mhdaakanif  
 bna mbdjb jac jg ahxih

30

gj wbkac ngfack akgb  
 nbfe kid skbdrafe la  
 hxqhg dalajafeka  
 cluicac mdalg  
 ahcac madkha  
 ekbfcjac nade ka  
 mdiji  
 fra  
 d

31

nb  
 ogac  
 bgfasv  
 hcqhbhkajb  
 khf egalja va  
 oihckanbfbal  
 actboahde ebfe qh  
 ava aflihdafgkbfad f  
 gdgcqha fgmadggj mbd

32

wsoqh bkbn blinmdg  
 c mbd jafink brjb mdhi  
 jbm dacadobogifka  
 jienseb tlngjj  
 a khtahka cik  
 inaskarin  
 niddr mb  
 djafi  
 nka

33

vi  
 eu mi  
 hdjbkaj  
 godbflaka  
 vblipekajbm  
 adcalhegifka  
 eiftdada mbdlah  
 xka cigrbk wbfikb  
 euaic ih fiebnnbdrb

34

eaesmbd jac bhedaefinc  
 kh eihe mhgccbfe qhgo  
 gesd arfaoadgeb  
 pjanafe eajjaace  
 jboijifeaka  
 lajhg qhg  
 ldabeih  
 eskif  
 ej

35

an  
 mgda  
 acechd  
 eihe mihd  
 eihejac ega  
 ljackac egal  
 jac eifjaogead  
 amifkdb bnaf  
 ehmjbladbc chdebeaea

36

bhaljbnbgfrbhluaibt  
 guhdaqhaeadaanaeedb  
 eifjaogea bjide cg  
 eifbnaaceodbg  
 nafemhda ajja  
 cajaoadb eh  
 eacafegd  
 bic gf  
 ing  
 da

37  
 eh  
 mdae  
 adbehf  
 aidagjj  
 abeeafegoa  
 beihe laqhaj  
 acacmdgecbadg  
 afe weiltadife b  
 gbfe cigakaedbladka  
 jbkdigeabjbrbhluachdh

38  
 fajbnakb gdb gfeihc  
 jacld bleadac gfc  
 mgdac qhaehpa  
 fgdbc afchg  
 ca mbd lac  
 niec e  
 iga  
 w

39  
 p  
 afg  
 cmbi  
 euaic eh  
 fajac linn  
 hfgqh adbc bma  
 dciffa lbdehead  
 afkdige gfkgrfakaub

40  
 pifea kgogfas ehf bhld  
 ige mbc jac hll  
 ac qhaeh beipe  
 afk acmadad  
 ehmd afkd  
 bc b  
 ji  
 de

41  
 jb  
 tgr  
 hd aqh  
 g aeigec  
 hd ebeaca bo  
 al jbnananb  
 gf ehjbeafkdhe  
 bkahxnb gfes mdicea

42  
 dfa afbkid begifehmdi  
 fifladbc lacebd  
 bleadac  
 bhfc nkaj aca  
 dfaj kh kga  
 hodbg n  
 bgeda  
 ka

43  
 n  
 if  
 idmc n  
 if bna s  
 nif acmdge  
 bjjay bjjay af  
 mbgx daegday oi  
 he qh hfkaoihen bl

44  
 linmbrfaeihuhde qh  
 ajac bhedac eiga  
 fe mdaec boafgd  
 jideqha  
 uajac  
 dbmm  
 ajjad  
 bg